UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/631,269	08/02/2000	Robert Jeff Heath	980182A	8516

20991 7590 05/03/2004

THE DIRECTV GROUP INC
PATENT DOCKET ADMINISTRATION RE/R11/A109
P O BOX 956
EL SEGUNDO, CA 90245-0956

EXAMINER	
MOORE, IAN N	
ART UNIT	**PAPER NUMBER**
2661	6

DATE MAILED: 05/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/631,269	Applicant(s) HEATH ET AL
	Examiner Ian N Moore	Art Unit 2661

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-51 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-51 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. An objection to the drawings is withdrawn since it is being amended accordingly.
2. Claim objections, on claims 1,18 and 35 are withdrawn since they are being amended accordingly.
3. Claims 1-51 are rejected by the same ground(s) of rejection, necessitated by the amendment, since the prior art references still read on the newly added claim limitations.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1,2,6,7,10-12, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Prieto (U.S. 6,381,228) in view of Montpetit (U.S. 6,366,761).

Regarding Claim 1, Prieto '228 discloses a method of performing bandwidth allocations, the method comprising:

receiving a bandwidth request from a terminal (see Fig. 2, Step 2, local UET sends reservation request through SRC to Satellite; also see col. 6, line 56-58 and col. 9, line 39-41;

note that a Reservation Query Message (RQM) (i.e. bandwidth request), from a user earth terminal (i.e. a terminal), is received at a satellite's uplink input.)

determining bandwidth request type and priority of the received bandwidth request (see Fig. 2, step 4, Satellite Controller process Request; also col. 9, line 5-9 and line 41-44; note that the MAC controller sets/determines the reservation query message based upon the type (i.e. request type) and service class of user (i.e. priority) and the portions of the requested bandwidth);

placing the bandwidth request in one of a plurality of a global queues (see Fig. 4, a plurality of a Wholesaler selection queues 58 at Stage 1; also see col. 9, line 32-34; the controller stores/queues RQM/ATM reservation request into a wholesaler queue.) based upon the determining step, each of the global queues corresponding to each of a plurality of channels (see Fig. 4, Uplink Bands; and see col. 9, line 41-44; note that each wholesaler selection queue is dedicated to each band of a plurality of retail users (i.e. one band contains a plurality of user channels) in the uplink);

moving the bandwidth request from the one global queue to one of a plurality of local queues (see Fig. 4, Stage 2, a plurality of retailer queues 60; and col. 9, line 46-55; note that a RQM request with the highest priority is selected and moved from a wholesaler queue to retailer queue as a winner), the plurality of local queues corresponding to the plurality of channels (see Fig. 4, Uplink channels 1, 2, 3; and col. 9, line 34-36; note that each retailer queue is dedicated for each retailer user (i.e. one user per channel)), wherein the bandwidth request is moved based on loading of the channels (**see col. 9, lines 1-9, 46-59; note that the RQM request's for the channel is moved/transferred according to the loading/fill-**

level/utilization of the rates/bandwidths/channels. Also, note that PFQ scheduler operates HUFS algorithm which ensures the optimal use of bandwidths/channels based upon loading/fill-level/utilization of bandwidth/channels); and

allocating the transmission slots in response to the bandwidth request stored in the one local queue (see Fig. 2, step 4, Satellite Controller generates Reply message; also see col. 9, line 55-56 and col. 10, line 5-7; note that the highest priority user request is defined and placed it in the retailer queue, and the request is granted by reserving/allocating the quanta/resources/slots. Then, the satellite Controller replies to an user earth terminal with an RGM (Reservation Grant Message) message indicating that the frequency channel for each user quanta/resources/slots have been reserved/allocated.)

Prieto '228 does not explicitly disclose each of the global queues corresponding to a data rate.

However, the above-mentioned claimed limitations are taught by Montpetit '761. In particular, Montpetit '761 teaches that each of the global queues corresponding to a data rate (see Fig. 6, Queue P1 for fixed data rate with high priority, and Queue P2 for lesser data rate priority; see col. 6, line 3-22; note that P1 queue corresponds to higher priority fixed data rate and P2 queue corresponds to lower priority data rate).

Note that Prieto '228 teaches a plurality of wholesaler queues (i.e. global queues). Montpetit '761 teaches the queues with various rate-based classes. In view of this, having the system of Prieto '228 and then given the teaching of Montpetit '761, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Prieto '228, by providing a plurality of queues (i.e. global queues) that

correspond the data rates such as high priority data rate and lower priority data rate, as taught by Montpetit '761, since Montpetit '761 states at col. 2, line 65-67 that such modification would make it possible to enable the data transmission to meet or exceed a user-selected standard of data transmission service, and different data packets in a data transmission may be assigned different levels of priority status so that the overall data transmission meets or exceeds the selected quality of service. The motivation being that by providing the plurality of queues and assigning various levels of priority rates to each queue, it will increase a quality of service for the user.

Regarding Claim 2, Prieto '228 discloses the bandwidth request in the receiving step as stated above in Claim 1.

Prieto '228 does not explicitly disclose at least one of a rate request and a volume request, the rate request specifying a constant number of transmission slots, the volume request specifying a specific number of transmission slots.

However, the above mentioned claimed limitations are taught by Montpetit '761. In particular, Montpetit '761 teaches at least one of a rate request and a volume request (see Montpetit '761 col. 9, line 5 to col. 8, line 9-16; note that the rate allocation request and bandwidth request are transmitted/received between user terminal and satellite), the rate request specifying a constant number of transmission slots (see Montpetit '761 col. 7, line 64 to col. 8, line 5; note that rate based allocation request is determined according to a specified number of slots per frame for transmission of a corresponding number of data packets. Thus, in order to define a rate, a constant number of transmission slots must be

determined/specified), the volume request specifying a specific number of transmission slots (see Montpetit '761 col. 8, line 32-40; note that when bandwidth allocation request is sent, the slots in a frame are allocated only once for transmission of a specified number of data packet. Thus, in order to define a volume base allocation/request, a specific/per-determined number of transmission slots must be determined/specified).

In view of this, having the system of Prieto '228 and then given the teaching of Montpetit '761, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Prieto '228, by providing a plurality of queues (i.e. global queues) which can transmit/receive both rate based allocation request and bandwidth based allocation request, as taught by Montpetit '761, since Montpetit '761 states at col. 2, line 65-67 that such modification would make it possible to enable the data transmission to meet or exceed a user-selected standard of data transmission service, and different data packets in a data transmission may be assigned different levels of priority status so that the overall data transmission meets or exceeds the selected quality of service. The motivation being that by providing the allocation request and bandwidth based allocation request, it will increase a quality of service for the user.

Regarding Claim 6, Prieto '228 discloses the global queues in the placing step as described above in Claim 1.

Prieto '228 does not explicitly disclose placing according to the bandwidth request type and the associated priority.

However, the above mentioned claimed limitations are taught by Montpetit '761. In particular, Montpetit '761 teaches disclose placing according to the bandwidth request type

(see col. 7, line 64 to col. 8, line 59; note that the bandwidth request type is either Rate-based allocation request or volume-based bandwidth allocation request) and the associated priority (see Montpetit '761 col. 5, line 61 to col. 6, line 2; note that each allocation request is placed into the queues according to the quality of service classes (i.e. priority).)

In view of this, having the system of Prieto '228 and then given the teaching of Montpetit '761, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Prieto '228, by providing a method to place the rate based allocation request and bandwidth based allocation request into the respective queues, as taught by Montpetit '761, since Montpetit '761 states at col. 2, line 65-67 that such modification would make it possible to enable the data transmission to meet or exceed a user-selected standard of data transmission service, and different data packets in a data transmission may be assigned different levels of priority status so that the overall data transmission meets or exceeds the selected quality of service. The motivation being that by placing various service class allocation requests into the queues before hand, it will decrease the request processing since the allocation requests have already classified/prioritized.

Regarding Claim 7, Prieto '228 discloses the bandwidth request type and priority of the received bandwidth request as described above in Claim 1.

Prieto '228 does not explicitly disclose high priority rate request, a low priority rate request, a high priority volume request, and a low priority volume request.

However, the above mentioned claimed limitations are taught by Montpetit '761. In particular, Montpetit '761 teaches high priority rate request (see Fig. 6, P1 130; col. 6, line 3-

14; col. 8, line 6-21; note that a high priority rate allocation request is assigned as P1 class and placed into P1 queue), a low priority rate request (see Fig. 6, P3 132; col. 6, line 23-33; col. 8, line 32-57; note that a low priority rate-based bandwidth allocation request is assigned as P3 class and placed into P3 queue), a high priority volume request (see Fig. 6, P2 131; col. 6, line 15-22; col. 8, line 6-21; note that a high priority volume allocation request is assigned as P2 class and placed into P2 queue), and a low priority volume request (see Fig. 6, P4 132; col. 6, line 33-41; col. 8, line 32-57; note that a low priority volume-based bandwidth allocation request is assigned as P4 class and placed into P3 queue.)

Note that Prieto '228 teaches a plurality of wholesaler queues (i.e. global queue), bandwidth requests and priority of received bandwidth request. Montpetit '761 teaches classifying/prioritizing the bandwidth rate-based allocation requests and volume-based allocation request and placing them into the respective queues. In view of this, having the system of Prieto '228 and then given the teaching of Montpetit '761, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Prieto '228, by further classifying/prioritizing the bandwidth request type and priority of requests into more specific the bandwidth rate-based allocation requests and volume-based allocation request and placing them into respective queues, as taught by Montpetit '761, since Montpetit '761 states at col. 2, line 65-67 that such modification would make it possible to enable the data transmission to meet or exceed a user-selected standard of data transmission service, and different data packets in a data transmission may be assigned different levels of priority status so that the overall data transmission meets or exceeds the selected quality of service. The motivation being that by classifying/prioritizing allocation

requests, it will increase the speed of the request processing since the allocation requests are already classified/prioritized.

Regarding Claim 10, Prieto '228 discloses the plurality of channels are designated as data channels that are sequentially ordered (see Fig. 4, plurality of data channels in Uplink Bands and they sequentially order from 1 to U links/channels).

Prieto '228 does not explicitly disclose the allocating step comprising: selectively assigning the transmission slots according to a prescribed order of the data channels based upon the bandwidth request type.

However, the above mentioned claimed limitations are taught by Montpetit '761. In particular, Montpetit '761 teaches the allocating step comprising: selectively assigning the transmission slots according to a prescribed order of the data channels based upon the bandwidth request type (see Montpetit '761 col. 7, line 49 to col. 8, line 40; note that uplink channels/slots are assigned/allocated according to two different formats of bandwidth allocation requests in the predetermined/prescribed order in the different priority/class queues/buffers: rate-based allocation request and volume-based allocation request.)

Note that Prieto '228 teaches a plurality of channels (or) unlink data slots in sequential order. Montpetit '761 teaches allocating/assigning each request in the uplink data slots/channels according to different priorities/classes. In view of this, having the system of Prieto '228 and then given the teaching of Montpetit '761, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Prieto '228, by providing a mechanism to allocate/assign each request in the uplink data

slots/channels according to different priorities/classes and predetermined/prescribed order, as taught by Montpetit '761, since Montpetit '761 states at col. 2, line 65-67 that such modification would make it possible to enable the data transmission to meet or exceed a user-selected standard of data transmission service, and different data packets in a data transmission may be assigned different levels of priority status so that the overall data transmission meets or exceeds the selected quality of service. The motivation being that by allocating/assigning each request in the uplink data slots/channels according to the different priorities/classes and predetermined/prescribed order, it will increase the speed of the request processing since the allocation requests have already classified/prioritized.

Regarding Claim 11, the combined system of Prieto '228 and Montpetit '761 discloses the prescribed order in selectively assigning step and the plurality of channels as descried above in Claim 10.

Furthermore, Montpetit '761 discloses assigning the first data channel if the bandwidth request type is rate request (see Fig. 6, P1 where P1 is the first high priority rate request queue/buffer; col. 6, line 3-14; and see Fig. 7, Bandwidth allocation table, where GT1 P1 is the first bandwidth allocation request being stored/assigned in the table; col. 14, line 4-19; note that high priority rate request is being stored/assigned as in the first channel/slot in the bandwidth allocation table (row frequency f1 and time t1)).

In view of this, having the system of Prieto '228 and then given the teaching of Montpetit '761, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Prieto '228, by providing a mechanism to

allocate/assign each rate request in the first uplink data slot/channel according to the different priorities/classes, as taught by Montpetit '761, for the same motivation as stated above in Claim 10.

Regarding Claim 12, the combined system of Prieto '228 and Montpetit '761 discloses the prescribed order in selectively assigning step and the plurality of channels as descried above in Claim 10.

Furthermore, Montpetit '761 discloses assigning the last data channel if the bandwidth request type is volume request (see Fig. 6, P4 where P4 is the last low priority volume request queue/buffer; col. 6, line 33-41; and Fig. 7, Bandwidth allocation table, where GT3 P4 is the last volume-based bandwidth allocation request being stored/assigned in the table; col. 14, line 4-19; note that low priority volume request is being stored/assigned as in the last channel/slot in the bandwidth allocation table (row frequency f4 and time t2)).

In view of this, having the system of Prieto '228 and then given the teaching of Montpetit '761, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Prieto '228, by providing a mechanism to allocate/assign each volume request in the last uplink data slots/channels according to the different priorities/classes, as taught by Montpetit '761, for the same motivation as stated above in Claim 10.

Regarding Claim 16, Prieto '228 discloses receiving a plurality of requests (see Prieto '228 col. 6, line 57-60; note that DAMA controller at the satellite queues the

bandwidth requests); and spreading the requests across each of the local queues (see Fig. 4, the bandwidth requests are distributed/spread according to each retailer queue).

Prieto '228 does not explicitly disclose receiving volume requests.

However, the above mentioned claimed limitations are taught by Montpetit '761. In particular, Montpetit '761 teaches receiving volume requests (see Montpetit '761 col. 9, line 5 to col. 8, line 9-16 and col. 9, line 26-39; note that the plurality of volume-based bandwidth requests are transmitted/received between user terminal and satellite.)

In view of this, having the system of Prieto '228 and then given the teaching of Montpetit '761, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Prieto '228, by providing a plurality of queues which can transmit/receive volume-based allocation request, as taught by Montpetit '761, since Montpetit '761 states at col. 2, line 65-67 that such modification would make it possible to enable the data transmission to meet or exceed a user-selected standard of data transmission service, and different data packets in a data transmission may be assigned different levels of priority status so that the overall data transmission meets or exceeds the selected quality of service. The motivation being that by providing the volume- based allocation requests, it will increase a quality of service for the user.

6. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Prieto '228 and Montpetit '761, as applied to claim 1 above, and further in view of Leung (U.S 6,574,231).

Regarding claim 3, Prieto '228 discloses local queues as stated above in Claim 1. Montpetit '761 discloses the bandwidth request in the receiving step is a rate request (see

Montpetit '761 col. 9, line 5 to col. 8, line 9-16; note that rate allocation request and bandwidth request are transmitted/received between user terminal and satellite).

Neither Prieto '228 nor Montpetit '761 does not explicitly discloses filling the one local queue with subsequent rate requests up to a queuing threshold; and filling another one of the local queues with additional rate requests upon filling the one local queue beyond the queuing threshold.

However, the above mentioned claimed limitations are taught by Leung '231. In particular, Leung '231 teaches filling the one queue with subsequent rate requests up to a queuing threshold; and filling another one of the local queues with additional rate requests upon filling the one queue beyond the queuing threshold (see Leung '231 col. 2, line 9-26; note that the received a data frame (i.e. Subsequent rate request) is written to first storage memory (i.e. filling the one queue). Then after, a second data frame (i.e. addition rate request) is received, and the size of the data frame exceeds the space in the storage location (i.e. a queuing threshold) in the memory. Then a second data frame is written into a second storage memory since the first storage memory can no longer accept any new data frame.) Thus, it is clear that a data frame that receives at the port can be the subsequent rate request and additional rate request. The memory storage locations are queues/buffers since they have a capability to store/hold/fill the data.)

In view of this, having the combined system of Prieto '228 and Montpetit '761, then given the teaching of Leung '231, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Prieto '228 and Montpetit '761, by proving a method to store/fill the frame/packet (i.e. original rate allocation

request) into a first memory storage (i.e. local queue) until it exceed the excepted space/threshold, then store/fill the additional frame/packet (i.e. additional request) into the second memory/local queue (i.e. another local queue), as taught by Leung '231, since Leung '231 states at col. 2, line 40-45 that such modification would make it possible to eliminate the needs for a separate memory. The motivation being that by utilizing local memory queues/storages, it will save cost for not requiring separate memory.

Regarding claim 4, neither Prieto '228 nor Montpetit '761 explicitly discloses the queuing threshold in the step of filling the one local queue is predetermined.

However, the above mentioned claimed limitations are taught by Leung '231. In particular, Leung '231 teaches the queuing threshold in the step of filling the one local queue is predetermined (see Leung '231 col. 4, line 55 to col. 5, line 11; note that the memory storage (i.e. local queue) size is set up to 1 M bytes.)

In view of this, having the combined system of Prieto '228 and Montpetit '761, then given the teaching of Leung '231, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Prieto '228 and Montpetit '761, by proving a fixed memory size for the storage queue, as taught by Leung '231, for the same motivation as stated above in Claim 3.

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Prieto '228, Montpetit '761 and Leung '231, as applied to claims 1-3 above, and further in view of Fan (U.S 6,424,622).

Regarding claim 5, the combined system of Prieto '228, Montpetit '761, and Leung '231 discloses the queuing threshold in the step of filling the one local queue according to the rate requests in the plurality of local queues as described above in Claim 1 and 3.

Neither Prieto '228, Montpetit '761, nor Leung '231 explicitly discloses the queuing threshold is dynamically established according to a total number of rate requests in the plurality of queues.

However, the above mentioned claimed limitations are taught by Fan '622. In particular, Fan '622 teaches the queuing threshold is dynamically established according to a total number of rate requests in the plurality of queues (see Fan '622 col. 2, line 49-44 and col. 6, line 6-62; note that the common threshold is dynamically set for the queues, and it is adapted to change to a new threshold value based upon the maximum length of the queue and the old value in the queues (i.e. total number of rate requests in the plurality of queues). Thus, in order to define the old threshold, the number of rate request in the plurality of queues must be determined first, then based upon the maximum length of the queue, the new threshold is dynamically calculated).

In view of this, having the system of Prieto '228, Montpetit '761 and Leung '231 then given the teaching of Fan '622, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Prieto '228, Montpetit '761 and Leung '231, by providing a way to calculate the dynamic buffer threshold based upon the maximum buffer size and the number of frames/data/requests in the current threshold, as taught by Fan '622, since Fan '622 states at col. 2, line 40-44 that such modification would make it possible to provide an ATM switch that uses a dynamic queue

threshold scheme that enables efficient utilization of available memory regardless of the numbers of overloaded queues. The motivation being that by utilizing dynamic buffer threshold, it will increase throughput and efficiency in the memory/buffer.

8. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Prieto '228 and Montpetit '761, as applied to claim 1 above, and further in view of Turner (U.S 4,849,968).

Regarding Claim 8, Prieto '228 discloses the bandwidth request in the receiving step, and it is received over at least one a data channel, the method further comprising: receiving a piggybacked volume request over the data channel (see col. 7, line 18-25; note that UET (user equipment terminal) utilizes a current data stream to piggyback more bandwidth resource request instead of sending a new RQM request message); placing the piggybacked request in a corresponding one of the global queues (see Fig. 4, a plurality of a Wholesaler selection queues 58 at Stage 1; also see col. 9 , line 32-34; the controller stores/queues the reservation request into a wholesaler queue.)

Prieto '228 does not explicitly disclose receiving a volume request over a contention channel.

However, the above mentioned claimed limitations are taught by Montpetit '761. In particular, Montpetit '761 teaches receiving a volume request over a contention channel (see col. 10, line 1-17; note that the ground terminal sends the volume-based request to the satellite by utilizing either an exiting allocated data channel (i.e. current data stream/channel) or contention channel.)

Note that Prieto '228 teaches receiving a bandwidth request over a current data stream into one of the wholesaler queues (i.e. global queue) by utilizing piggybacking mechanism. Montpetit '761 teaches receiving volume request and a method of utilizing contention channel to send request to the satellite from the ground station. In view of this, having the system of Prieto '228 and then given the teaching of Montpetit '761, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Prieto '228, by providing a mechanism to receive the volume request utilizing the contention channel, as taught by Montpetit '761, since Montpetit '761 states at col. 2, line 65-67 that such modification would make it possible to enable the data transmission to meet or exceed a user-selected standard of data transmission service, and different data packets in a data transmission may be assigned different levels of priority status so that the overall data transmission meets or exceeds the selected quality of service. The motivation being that by utilizing a contention channel to send allocation requests, it will increase the probability of the satellite receiving the request since there is more than one option to send the request.

Neither Prieto '228 nor Montpetit '761 explicitly discloses determining whether the plurality of channels are oversubscribed; and selectively discarding the request based upon the step of determining whether the plurality of channels are oversubscribed.

However, the above mentioned claimed limitations are taught by Turner'968. In particular, Turner'968 teaches determining whether the plurality of channels are oversubscribed (see col. 2, line 22-27; note that the packet processor determines the overload/oversubscribed condition by first determining allocated number of buffer slots (i.e. a plurality of channels)); and selectively discarding the volume request based upon the step

of determining whether the plurality of channels are oversubscribed (see col. 2, line 27-38; note that when the channel connection is overload and the buffer becomes full, the processor determines which packets (i.e. volume requests) are discarded. The determining is performed during the overload condition by selecting between the connections using more than their allocated buffer slots and the connections operating within their allocation. The connections using more than their allocated buffer slots lose packets (i.e. volume requests).)

Note that the combined system of Prieto '228 and Montpetit '761 teaches piggyback volume requests are received in the corresponding global queue. Turner'968 teaches determining overload condition and selectively discarding the packets according to the buffer (i.e. queue) allocation. In view of this, having the combined system of Prieto '228 and Montpetit '761, then given the teaching of Turner'968, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Prieto '228 and Montpetit '761, by providing a buffer management mechanism which determines the overload/oversubscribe condition of allocated buffer slots (i.e. a plurality of channels) and discarding selected packets (i.e. volume requests), as taught by Turner'968, since Turner'968 states at col. 3, line 1-6 that such modification would make it possible to efficiently receive, store, and transmit packets, and only when overloaded will excess packets be lost with nonexcess packets protected. The motivation being that by determining and discarding packets according to the priority in the queue/buffer, it will avoid the buffer/queue overload condition.

Regarding Claim 9, the combined system of Prieto '228, Montpetit '761 and Turner'968 discloses the step of determining whether the plurality of channels are oversubscribed as described above in Claim 8.

Furthermore, Turner'968 discloses determining whether each of the plurality of local queues exceeds a respective queuing threshold (see col. 2, line 39-45; the processor identifies/determines the excess packets by comparing with current buffer allocation (i.e. queuing threshold). Thus, it is clear the packet processor determines whether the buffer's fullness utilizing a predetermined allocation.)

In view of this, having the combined system of Prieto '228 and Montpetit '761, then given the teaching of Turner'968, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Prieto '228 and Montpetit '761, by providing a buffer management mechanism which determines the overload/oversubscribe condition of allocated buffer utilizing the buffer fullness/predetermined allocation, as taught by Turner'968, for the same motivation as stated above in claim 8.

9. Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Prieto '228 and Montpetit '761, as applied to claim 1 above, and further in view of Charvillat (U.S 5,315,586).

Regarding Claim 13, Prieto '228 discloses receiving a plurality of bandwidth requests (see Prieto '228 col. 6, line 57-60; note that DAMA controller at the satellite queues

the bandwidth requests), moving the request between local and their corresponding global queues as described above in Claim 1.

Prieto '228 does not explicitly disclose moving the rate requests from the local queues to the global queue for reallocation in response to next/another bandwidth request.

However, the above mentioned claimed limitations are taught by Montpetit '761. In particular, Montpetit '761 teaches moving the rate requests from the queues for reallocation in response to next/another slots for the band width request (see Montpetit '761 col. 15, line 57 to col. 16, line 17; note that when unallocated slots to satisfy next/another high priority bandwidth request, the processor preempts/reallocates the lower priority requests from the queuing slots in order to replace with a higher priority request.)

Note that Prieto '228 teaches receiving and moving bandwidth request between global queues (i.e. wholesaler queues) that stored per band requests, and local queues (i.e. retailer queues) that stored per user/channel request after accepting the reservation. Montpetit '761 teaches that reallocating/moving rate requests according to their priority, and since these request have been accepted and placed in the queues. Prieto '228 teaches two types of queues: wholesaler and retailer queues. In order to reallocate the requests per Montpetit '761 teaching, it is obvious that the requests must move/reallocate from retailer queues (i.e. local queues) to wholesaler queues (i.e. corresponding global queues) so that prioritized request can be processed.

In view of this, having the system of Prieto '228 and then given the teaching of Montpetit '761, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Prieto '228, by providing a mechanism to

reallocate/move each request between queues according their priorities/classes, as taught by Montpetit '761, since Montpetit '761 states at col. 2, line 65-67 that such modification would make it possible to enable the data transmission to meet or exceed a user-selected standard of data transmission service, and different data packets in a data transmission may be assigned different levels of priority status so that the overall data transmission meets or exceeds the selected quality of service. The motivation being that by reallocating/moving the requests between the queues according to their priorities/classes, it can easily process the higher priority requests first.

Neither Prieto '228 nor Montpetit '761 explicitly discloses receiving a defragmentation command and reallocation in response to the defragmentation command.

However, the above mentioned claimed limitations are taught by Charvillat'586. In particular, Charvillat'586 teaches receiving a defragmentation command and reallocation in response to the defragmentation command (see Charvillat'586, see col. 1, line 58-63 and col. 4, line 15-33; note that the user terminal sends reallocation request/command (i.e. defragmentation command) to the switch since the portion of the bandwidth is being used/allocated by other user's connection. Upon receipt of the reallocation request/command, the switch reallocates the bandwidth utilizing the reserved/secondary/pool/shared memory).

Note that the combined system of Prieto '228 and Montpetit '761 teaches reallocation/moving requests between wholesaler queues and retailer queues according to priority of the rate request. Charvillat'586 teaches receiving allocation command/request and performs reallocation accordingly. In view of this, having the combined system of Prieto '228

and Montpetit '761, then given the teaching of Charvillat'586, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Prieto '228 and Montpetit '761, by providing a mechanism to trigger the reallocation of bandwidth request/command, as taught by Charvillat'586, since Charvillat'586 states at col. 1, line 39-44 that such modification would make it possible to provide a flow enforcement arrangement which ensures precision cell-level traffic control by allowing user terminal to issue a request to increase the amount of bandwidth allocated. The motivation being that by providing the user to sends reallocating/moving requests/command, it can increase the flow control during the transmission.

Regarding Claim 14, the combined system of Prieto '228 and Montpetit '761 discloses receiving the plurality of bandwidth requests as described above in Claim 1. Prieto '228 discloses associating the follow-up request with the original request and placing the bandwidth requests to a particular local queue that stored the original request among the plurality of local queues (see Fig. 4 retailer queues 60 where each user's request is identified by its own respective queue. Thus, the original request and next request (i.e. a follow-up request) must be first related then placed right next to each other in sequential order in the respective retailer queues because each retailer queue uniquely stores each user request).

Prieto '228 does not explicitly disclose receiving volume requests.

However, the above mentioned claimed limitations are taught by Montpetit '761. In particular, Montpetit '761 teaches receiving volume requests (see Montpetit '761 col. 9, line 5

to col. 8, line 9-16 and col. 9, line 26-39; note that the plurality of volume-based bandwidth requests are transmitted/received between user terminal and satellite.)

In view of this, having the system of Prieto '228 and then given the teaching of Montpetit '761, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Prieto '228, by providing a plurality of queues which can transmit/receive bandwidth based allocation request, as taught by Montpetit '761, since Montpetit '761 states at col. 2, line 65-67 that such modification would make it possible to enable the data transmission to meet or exceed a user-selected standard of data transmission service, and different data packets in a data transmission may be assigned different levels of priority status so that the overall data transmission meets or exceeds the selected quality of service. The motivation being that by providing the volume- based allocation requests, it will increase a quality of service for the user.

10. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Prieto '228 and Montpetit '761, as applied to claim 14 above, and further in view of Haulin (U.S 5,502,988).

Regarding claim 15, the combined system of Prieto '228 and Montpetit '761 discloses the associating step and local queues as described above in Claim 14.

Neither Prieto '228 nor Montpetit '761 explicitly disclose maintaining a database of pointers for the terminal, one of the pointers specifying the particular queue.

However, the above mentioned claimed limitations are taught by Haulin '231. In particular, Haulin '231 teaches maintaining a database (see Fig. 2, Buffer Memory 32) of pointers for the terminal, one of the pointers specifying the particular queue (see Fig. 2, Input

and output queues 44.1 to 44.n; col. 11, line 39-50 and col. 6, line 48 to col. 7, line 10; the buffer memory stores pointers in order to identify the positions of the packets in the queues. The pointer for the input queue is for the terminal and the pointer for the output queue is for the bandwidth request location in that particular queue.)

Note that Prieto '228 teaches storing bandwidth requests from the terminal into the local queues. Haulin '231 teaches a buffer memory which stores the pointers to the packets in the input and output queues. In view of this, having the combined system of Prieto '228 and Montpetit '761, then given the teaching of Haulin '231, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Prieto '228 and Montpetit '761, by proving a buffer memory as a database to store/maintain the pointers of various packets (i.e. bandwidth request) so that they can be identified, as taught by Haulin '231, since Haulin '231 states at col. 1, line 66 to col. 3, line 4 that such modification would make it possible to provide error tolerance by a continuous maintenance of pointer handling in a queue system with dynamic indirect addressing. The motivation being that by storing pointers in the memory, it can increase the ability to accurately/correctly identifies the location of the packet in the queue.

11. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Prieto '228 in view of Montpetit '761.

Regarding Claim 16, Prieto '228 discloses receiving a plurality of requests (see Prieto '228 col. 6, line 57-60; note that DAMA controller at the satellite queues the

bandwidth requests); and spreading the requests across each of the local queues (see Fig. 4, the bandwidth requests are distributed/spread according to each retailer queue).

Prieto '228 does not explicitly disclose receiving volume requests.

However, the above mentioned claimed limitations are taught by Montpetit '761. In particular, Montpetit '761 teaches receiving volume requests (see Montpetit '761 col. 9, line 5 to col. 8, line 9-16 and col. 9, line 26-39; note that the plurality of volume-based bandwidth requests are transmitted/received between user terminal and satellite.)

In view of this, having the system of Prieto '228 and then given the teaching of Montpetit '761, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Prieto '228, by providing a plurality of queues which can transmit/receive bandwidth based allocation request, as taught by Montpetit '761, since Montpetit '761 states at col. 2, line 65-67 that such modification would make it possible to enable the data transmission to meet or exceed a user-selected standard of data transmission service, and different data packets in a data transmission may be assigned different levels of priority status so that the overall data transmission meets or exceeds the selected quality of service. The motivation being that by providing the volume- based allocation requests, it will increase a quality of service for the user.

12. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Prieto '228 and Montpetit '761, as applied to claim 16 above, and further in view of Filipiak (U.S 5,193,090).

Regarding claim 17, the combined system of Prieto '228 and Montpetit '761 discloses the local queues and the volume requests in the respective local queue as described above in Claim 1 and 16.

Neither Prieto '228 nor Montpetit '761 explicitly disclose each queue has a counter that counts a quantity of the requests in the respective queue, the distributing step comprising: comparing counter values of the counters with respective predetermined thresholds corresponding to the queues.

However, the above mentioned claimed limitations are taught by Filipiak '090. In particular, Filipiak '090 teaches each queue has a counter (see Fig. 13, plurality of counters 119-123) that counts a quantity of the requests in the respective queue (see Fig. 13, queue 106; see col. 11, line 16-41), the distributing step comprising: comparing counter values of the counters with respective predetermined thresholds corresponding to the queues (see abstract and col. 1, line 16-26, col. 2, line 14-29; note that the counters indicates a queue placing. The memory stores the thresholds values according to the size/bandwidth of each queue, and the threshold values are compared to the counter values in order to determine the number of the packets (i.e. the quantity of the requests) in the queue.)

Note that the combined system of Prieto '228 and Montpetit '761 teaches storing bandwidth volume requests into the corresponding/respective local queue. Filipiak '090 teaches that a queue having a counter, and a counter compares the counter values with threshold values of the queue. In view of this, having the combined system of Prieto '228 and Montpetit '761, then given the teaching of Filipiak '090, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Prieto '228 and Montpetit '761, by providing a counter at each queue memory (i.e. local queue) and a counter compares the counter values (i.e. counts of a quantity of the requests) with threshold values of the queue, as taught by Filipiak '090, since

Filipiak '090 states at col. 2, line 60-67 that such modification would make it possible to ensures that the bandwidth allocated to each station contending for access to a common channel or transfer medium/bus architecture is kept in known limits independently of traffic load conditions. The motivation being that by utilizing counters, it can increase the ability to accurately/correctly monitor/maintain the bandwidth requests in the corresponding queues.

13. Claims 18,19,23,24,27-29, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Prieto (U.S. 6,381,228) in view of Montpetit (U.S. 6,366,761).

Regarding Claim 18, Prieto '228 discloses a communication system for performing bandwidth allocations, the system comprising:

a plurality of global queues (see Fig. 4, a plurality of wholesaler selection queues 58 at Stage 1), each of the global queues being configured to store a bandwidth request received from a terminal (see Fig. 2, Step 2, local UET sends reservation request through SRC to Satellite; also see col. 6, line 56-58 and col. 9, line 39-41; note that a Reservation Query Message (RQM) (i.e. bandwidth request), from a user earth terminal (i.e. a terminal), is received at a satellite's uplink input.);

a bandwidth control processor (Fig. 4, Medial Access Controller, MAC Controller 50) coupled the plurality of global queues (see col. 7, line 48-67; RQM are routed to MAC then toward the queues; the queues are within MAC controller), the bandwidth control processor being configured to determine bandwidth request type and priority of the received bandwidth request (see Fig. 2, step 4, Satellite Controller process Request; also col. 9, line 5-9 and line 41-44; note that the MAC controller sets/determines the reservation query message based

upon the type (i.e. request type) and service class of user (i.e. priority) and the portions of the requested bandwidth)

and to place the bandwidth request in one of a plurality of a global queues (see Fig. 4, a plurality of a Wholesaler selection queues 58 at Stage 1; also see col. 9, line 32-34; the controller stores/queues RQM/ATM reservation request into a wholesaler queue.) based upon the determined bandwidth request type and priority, wherein each of the global queues corresponds to each of a plurality of channels (see Fig. 4, Uplink Bands; and see col. 9, line 41-44; note that each wholesaler selection queue is dedicated to each band of a plurality of retail users (i.e. one band contains a plurality of user channels) in the uplink); and

a plurality of local queues coupled to the BCP (see Fig. 4, Stage 2, a plurality of retailer queues 60; see col. 7, line 48-67; RQM are routed to MAC then toward the queues; the queues are within MAC controller), the plurality of local queues corresponding to the plurality of channels (see Fig. 4, Uplink channels 1, 2, 3; and col. 9, line 34-36; note that each retailer queue is dedicated for each retailer user (i.e. one user per channel) in the uplink), one of the plurality of local queues storing the bandwidth request is moved from the one global queue based on loading of the channels **(see Fig. 4, Stage 2, a plurality of retailer queues 60; and see col. 9, lines 1-9, 46-59; note that the RQM request's for the channel is moved/transferred from wholesaler queue according to the loading/fill-level/utilization of the rates/bandwidths/channels. Also, note that PFQ scheduler operates HUFS algorithm, which ensures the optimal use of bandwidth/channels, based upon loading/fill-level/utilization of bandwidth/channels)**;

wherein the BCP allocates the transmission slots in response to the bandwidth request stored in the one local queue (see Fig. 2, step 4, Satellite Controller (i.e. MAC) generates Reply message; also see col. 9, line 55-56 and col. 10, line 5-7; note that the highest priority user request is defined and placed it in the retailer queue, and the request is granted by reserving/allocating the quanta/resources/slots. Then, the satellite Controller replies to an user earth terminal with an RGM (Reservation Grant Message) message indicating that the frequency channel for each user quanta/resources/slots have been reserved/allocated.).

Prieto '228 does not explicitly disclose each of the global queues corresponds to a data rate.

However, the above mentioned claimed limitations are taught by Montpetit '761. In particular, Montpetit '761 teaches that each of the global queues corresponds to a data rate (see Fig. 6, Queue P1 for fixed data rate with high priority, and Queue P2 for lesser data rate priority; see col. 6, line 3-22; note that P1 queue corresponds to higher priority fixed data rate and P2 queue corresponds to lower priority data rate).

Note that Prieto '228 teaches a plurality of wholesaler queues (i.e. global queues). Montpetit '761 teaches the queues with various rate-based classes. In view of this, having the system of Prieto '228 and then given the teaching of Montpetit '761, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Prieto '228, by providing a plurality of queues (i.e. global queues) that correspond the data rates such as high priority data rate and lower priority data rate, as taught by Montpetit '761, since Montpetit '761 states at col. 2, line 65-67 that such modification would make it possible to enable the data transmission to meet or exceed a user-selected

standard of data transmission service, and different data packets in a data transmission may be assigned different levels of priority status so that the overall data transmission meets or exceeds the selected quality of service. The motivation being that by providing the plurality of queues and assigning various levels of priority rates to each queue, it will increase a quality of service for the user.

Regarding Claim 19, Prieto '228 discloses the bandwidth request as stated above in Claim 18.

Prieto '228 does not explicitly disclose at least one of a rate request and a volume request, the rate request specifying a constant number of transmission slots, the volume request specifying a specific number of transmission slots.

However, the above mentioned claimed limitations are taught by Montpetit '761. In particular, Montpetit '761 teaches at least one of a rate request and a volume request (see Montpetit '761 col. 9, line 5 to col. 8, line 9-16; note that the rate allocation request and bandwidth request are transmitted/received between user terminal and satellite), the rate request specifying a constant number of transmission slots (see Montpetit '761 col. 7, line 64 to col. 8, line 5; note that rate based allocation request is determined according to a specified number of slots per frame for transmission of a corresponding number of data packets. Thus, in order to define a rate, a constant number of transmission slots must be determined/specified), the volume request specifying a specific number of transmission slots (see Montpetit '761 col. 8, line 32-40; note that when bandwidth allocation request is sent, the slots in a frame are allocated only once for transmission of a specified number of data

packet. Thus, in order to define a volume base allocation/request, a specific/per-determined number of transmission slots must be determined/specified).

In view of this, having the system of Prieto '228 and then given the teaching of Montpetit '761, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Prieto '228, by providing a plurality of queues (i.e. global queues) which can transmit/receive both rate based allocation request and bandwidth based allocation request, as taught by Montpetit '761, since Montpetit '761 states at col. 2, line 65-67 that such modification would make it possible to enable the data transmission to meet or exceed a user-selected standard of data transmission service, and different data packets in a data transmission may be assigned different levels of priority status so that the overall data transmission meets or exceeds the selected quality of service. The motivation being that by providing the allocation request and bandwidth based allocation request, it will increase a quality of service for the user.

Regarding Claim 23, Prieto '228 discloses the global queues as described above in Claim 18.

Prieto '228 does not explicitly disclose designated according to the bandwidth request type and the associated priority.

However, the above mentioned claimed limitations are taught by Montpetit '761. In particular, Montpetit '761 teaches disclose designated according to the bandwidth request type (see col. 7, line 64 to col. 8, line 59; note that the bandwidth request type is either Rate-based allocation request or volume-based bandwidth allocation request) and the associated

priority (see Montpetit '761 col. 5, line 61 to col. 6, line 2; note that each allocation request is placed into the queues according to the quality of service classes (i.e. priority).)

In view of this, having the system of Prieto '228 and then given the teaching of Montpetit '761, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Prieto '228, by providing a method to place the rate based allocation request and bandwidth based allocation request into the respective queues, as taught by Montpetit '761, since Montpetit '761 states at col. 2, line 65-67 that such modification would make it possible to enable the data transmission to meet or exceed a user-selected standard of data transmission service, and different data packets in a data transmission may be assigned different levels of priority status so that the overall data transmission meets or exceeds the selected quality of service. The motivation being that by placing various service class allocation requests into the queues before hand, it will decrease the request processing since the allocation requests have already classified/prioritized.

Regarding Claim 24, Prieto '228 discloses the bandwidth request type and priority of the received bandwidth request as described above in Claim 18.

Prieto '228 does not explicitly disclose high priority rate request, a low priority rate request, a high priority volume request, and a low priority volume request.

However, the above mentioned claimed limitations are taught by Montpetit '761. In particular, Montpetit '761 teaches high priority rate request (see Fig. 6, P1 130; col. 6, line 3-14; col. 8, line 6-21; note that a high priority rate allocation request is assigned as P1 class and placed into P1 queue), a low priority rate request (see Fig. 6, P3 132; col. 6, line 23-33;

col. 8, line 32-57; note that a low priority rate-based bandwidth allocation request is assigned as P3 class and placed into P3 queue), a high priority volume request (see Fig. 6, P2 131; col. 6, line 15-22; col. 8, line 6-21; note that a high priority volume allocation request is assigned as P2 class and placed into P2 queue), and a low priority volume request (see Fig. 6, P4 132; col. 6, line 33-41; col. 8, line 32-57; note that a low priority volume-based bandwidth allocation request is assigned as P4 class and placed into P3 queue.)

Note that Prieto '228 teaches a plurality of wholesaler queues (i.e. global queue), bandwidth requests and priority of received bandwidth request. Montpetit '761 teaches classifying/prioritizing the bandwidth rate-based allocation requests and volume-based allocation request and placing them into the respective queues. In view of this, having the system of Prieto '228 and then given the teaching of Montpetit '761, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Prieto '228, by further classifying/prioritizing the bandwidth request type and priority of requests into more specific the bandwidth rate-based allocation requests and volume-based allocation request and placing them into respective queues, as taught by Montpetit '761, since Montpetit '761 states at col. 2, line 65-67 that such modification would make it possible to enable the data transmission to meet or exceed a user-selected standard of data transmission service, and different data packets in a data transmission may be assigned different levels of priority status so that the overall data transmission meets or exceeds the selected quality of service. The motivation being that by classifying/prioritizing allocation requests, it will increase the speed of the request processing since the allocation requests are already classified/prioritized.

Regarding Claim 27, Prieto '228 discloses the plurality of channels are designated as data channels that are sequentially ordered (see Fig. 4, plurality of data channels in Uplink Bands and they sequentially order from 1 to U links/channels) and BCP.

Prieto '228 does not explicitly disclose selectively assigning the transmission slots according to a prescribed order of the data channels based upon the bandwidth request type.

However, the above mentioned claimed limitations are taught by Montpetit '761. In particular, Montpetit '761 teaches selectively assigning the transmission slots according to a prescribed order of the data channels based upon the bandwidth request type (see Montpetit '761 col. 7, line 49 to col. 8, line 40; note that uplink channels/slots are assigned/allocated according to two different formats of bandwidth allocation requests in the predetermined/prescribed order in the different priority/class queues/buffers: rate-based allocation request and volume-based allocation request.)

Note that Prieto '228 teaches a plurality of channels (or) unlink data slots in sequential order. Montpetit '761 teaches allocating/assigning each request in the uplink data slots/channels according to different priorities/classes. In view of this, having the system of Prieto '228 and then given the teaching of Montpetit '761, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Prieto '228, by providing a mechanism to allocate/assign each request in the uplink data slots/channels according to different priorities/classes and predetermined/prescribed order, as taught by Montpetit '761, since Montpetit '761 states at col. 2, line 65-67 that such modification would make it possible to enable the data transmission to meet or exceed a user-

selected standard of data transmission service, and different data packets in a data transmission may be assigned different levels of priority status so that the overall data transmission meets or exceeds the selected quality of service. The motivation being that by allocating/assigning each request in the uplink data slots/channels according to the different priorities/classes and predetermined/prescribed order, it will increase the speed of the request processing since the allocation requests have already classified/prioritized.

Regarding Claim 28, the combined system of Prieto '228 and Montpetit '761 discloses the prescribed order as descried above in Claim 27.

Furthermore, Montpetit '761 discloses the first data channel if the bandwidth request type is rate request (see Fig. 6, P1 where P1 is the first high priority rate request queue/buffer; col. 6, line 3-14; and see Fig. 7, Bandwidth allocation table, where GT1 P1 is the first bandwidth allocation request being stored/assigned in the table; col. 14, line 4-19; note that high priority rate request is being stored/assigned as in the first channel/slot in the bandwidth allocation table (row frequency f1 and time t1)).

In view of this, having the system of Prieto '228 and then given the teaching of Montpetit '761, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Prieto '228, by providing a mechanism to allocate/assign each rate request in the first uplink data slot/channel according to the different priorities/classes, as taught by Montpetit '761, for the same motivation as stated above in Claim 27.

Regarding Claim 29, the combined system of Prieto '228 and Montpetit '761 discloses the prescribed order as descried above in Claim 27.

Furthermore, Montpetit '761 discloses the last data channel if the bandwidth request type is volume request (see Fig. 6, P4 where P4 is the last low priority volume request queue/buffer; col. 6, line 33-41; and Fig. 7, Bandwidth allocation table, where GT3 P4 is the last volume-based bandwidth allocation request being stored/assigned in the table; col. 14, line 4-19; note that low priority volume request is being stored/assigned as in the last channel/slot in the bandwidth allocation table (row frequency f4 and time t2)).

In view of this, having the system of Prieto '228 and then given the teaching of Montpetit '761, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Prieto '228, by providing a mechanism to allocate/assign each volume request in the last uplink data slots/channels according to the different priorities/classes, as taught by Montpetit '761, for the same motivation as stated above in Claim 27.

Regarding Claim 33, Prieto '228 discloses one of the global queues stores a plurality of requests (see Prieto '228 col. 6, line 57-60; note that controller at the satellite queues the bandwidth requests into the global queue); and the BCP spreading the volume requests across the local queues (see Fig. 4, the bandwidth requests are distributed/spread according to each retailer queue by the controller).

Prieto '228 does not explicitly disclose storing the volume requests.

However, the above mentioned claimed limitations are taught by Montpetit '761. In particular, Montpetit '761 teaches storing the volume requests (see Montpetit '761 col. 9, line 5 to col. 8, line 9-16 and col. 9, line 26-39; note that the plurality of volume-based bandwidth requests are transmitted/received between user terminal and satellite.)

In view of this, having the system of Prieto '228 and then given the teaching of Montpetit '761, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Prieto '228, by providing a plurality of queues which can transmit/receive volume-based allocation request, as taught by Montpetit '761, since Montpetit '761 states at col. 2, line 65-67 that such modification would make it possible to enable the data transmission to meet or exceed a user-selected standard of data transmission service, and different data packets in a data transmission may be assigned different levels of priority status so that the overall data transmission meets or exceeds the selected quality of service. The motivation being that by providing the volume- based allocation requests, it will increase a quality of service for the user.

14. Claims 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Prieto '228 and Montpetit '761, as applied to claim 18 above, and further in view of Leung (U.S 6,574,231).

Regarding claim 20, Prieto '228 discloses local queues as stated above in Claim 18. Montpetit '761 discloses the bandwidth request is a rate request (see Montpetit '761 col. 9, line 5 to col. 8, line 9-16; note that rate allocation request and bandwidth request are transmitted/received between user terminal and satellite).

Neither Prieto '228 nor Montpetit '761 does not explicitly discloses the one local queue being filled with subsequent rate requests up to a queuing threshold, another one of the local queues being filled up with additional rate requests in response to the one local queue being filled beyond the queuing threshold.

However, the above mentioned claimed limitations are taught by Leung '231. In particular, Leung '231 teaches the one local queue being filled with subsequent rate requests up to a queuing threshold, another one of the local queues being filled up with additional rate requests in response to the one local queue being filled beyond the queuing threshold (see Leung '231 col. 2, line 9-26; note that the received a data frame (i.e. Subsequent rate request) is written to first storage memory (i.e. filling the one queue). Then after, a second data frame (i.e. addition rate request) is received, and the size of the data frame exceeds the space in the storage location (i.e. a queuing threshold) in the memory. Then a second data frame is written into a second storage memory since the first storage memory can no longer accept any new data frame.) Thus, it is clear that a data frame that receives at the port can be the subsequent rate request and additional rate request. The memory storage locations are queues/buffers since they have a capability to store/hold/fill the data.)

In view of this, having the combined system of Prieto '228 and Montpetit '761, then given the teaching of Leung '231, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Prieto '228 and Montpetit '761, by proving a method to store/fill the frame/packet (i.e. original rate allocation request) into a first memory storage (i.e. local queue) until it exceed the excepted space/threshold, then store/fill the additional frame/packet (i.e. additional request) into the

second memory/local queue (i.e. another local queue), as taught by Leung '231, since Leung '231 states at col. 2, line 40-45 that such modification would make it possible to eliminate the needs for a separate memory. The motivation being that by utilizing local memory queues/storages, it will save cost for not requiring separate memory.

Regarding claim 21, neither Prieto '228 nor Montpetit '761 explicitly discloses the queuing threshold is predetermined.

However, the above mentioned claimed limitations are taught by Leung '231. In particular, Leung '231 teaches the queuing threshold is predetermined (see Leung '231 col. 4, line 55 to col. 5, line 11; note that the memory storage (i.e. local queue) size is set up to 1 M bytes.)

In view of this, having the combined system of Prieto '228 and Montpetit '761, then given the teaching of Leung '231, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Prieto '228 and Montpetit '761, by proving a fixed memory size for the storage queue, as taught by Leung '231, for the same motivation as stated above in Claim 20.

15. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Prieto '228, Montpetit '761 and Leung '231, as applied to claims 18-20 above, and further in view of Fan (U.S 6,424,622).

Regarding claim 22, the combined system of Prieto '228, Montpetit '761, and Leung '231 discloses the queuing threshold is established according to the rate requests in the plurality of local queues as described above in Claim 18 and 20.

Neither Prieto '228, Montpetit '761, nor Leung '231 explicitly discloses the queuing threshold is dynamically established according to a total number of rate requests in the plurality of queues.

However, the above mentioned claimed limitations are taught by Fan '622. In particular, Fan '622 teaches the queuing threshold is dynamically established according to a total number of rate requests in the plurality of queues (see Fan '622 col. 2, line 49-44 and col. 6, line 6-62; note that the common threshold is dynamically set for the queues, and it is adapted to change to a new threshold value based upon the maximum length of the queue and the old value in the queues (i.e. total number of rate requests in the plurality of queues). Thus, in order to define the old threshold, the number of rate request in the plurality of queues must be determined first, then based upon the maximum length of the queue, the new threshold is dynamically calculated).

In view of this, having the system of Prieto '228, Montpetit '761 and Leung '231 then given the teaching of Fan '622, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Prieto '228, Montpetit '761 and Leung '231, by providing a way to calculate the dynamic buffer threshold based upon the maximum buffer size and the number of frames/data/requests in the current threshold, as taught by Fan '622, since Fan '622 states at col. 2, line 40-44 that such modification would make it possible to provide an ATM switch that uses a dynamic queue

threshold scheme that enables efficient utilization of available memory regardless of the numbers of overloaded queues. The motivation being that by utilizing dynamic buffer threshold, it will increase throughput and efficiency in the memory/buffer.

16. Claims 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Prieto '228 and Montpetit '761, as applied to claim 18 above, and further in view of Turner (U.S 4,849,968).

Regarding Claim 25, Prieto '228 discloses BCP as described above in Claim 18. Prieto '228 further discloses the bandwidth request is received over at least one a data channel, a follow-up request associated with the request (see col. 7, line 18-25; note that UET (user equipment terminal) utilizes a current data stream to piggyback more bandwidth resource request instead of sending a new RQM request message) being placed in corresponding one of the global queue (see Fig. 4, a plurality of a Wholesaler selection queues 58 at Stage 1; also see col. 9, line 32-34; the controller stores/queues the reservation request into a wholesaler queue.) and

Prieto '228 does not explicitly disclose a volume request is received over a contention channel.

However, the above mentioned claimed limitations are taught by Montpetit '761. In particular, Montpetit '761 teaches that a volume request is received over a contention channel (see col. 10, line 1-17; note that the ground terminal sends the volume-based request to the satellite by utilizing either an exiting allocated data channel (i.e. current data stream/channel) or contention channel.)

Note that Prieto '228 teaches receiving a bandwidth request over a current data stream into one of the wholesaler queues (i.e. global queue) by utilizing piggybacking mechanism. Montpetit '761 teaches receiving volume request and a method of utilizing contention channel to send request to the satellite from the ground station. In view of this, having the system of Prieto '228 and then given the teaching of Montpetit '761, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Prieto '228, by providing a mechanism to receive the volume request utilizing the contention channel, as taught by Montpetit '761, since Montpetit '761 states at col. 2, line 65-67 that such modification would make it possible to enable the data transmission to meet or exceed a user-selected standard of data transmission service, and different data packets in a data transmission may be assigned different levels of priority status so that the overall data transmission meets or exceeds the selected quality of service. The motivation being that by utilizing a contention channel to send allocation requests, it will increase the probability of the satellite receiving the request since there is more than one option to send the request.

Neither Prieto '228 nor Montpetit '761 explicitly discloses selectively discarding the request based upon determining that the plurality of channels are oversubscribed.

However, the above mentioned claimed limitations are taught by Turner'968. In particular, Turner'968 teaches selectively discarding the volume request based upon the step of determining whether the plurality of channels are oversubscribed (see col. 2, line 22-27; note that the packet processor determines the overload/oversubscribed condition by first determining allocated number of buffer slots (i.e. a plurality of channels); also, see col. 2, line 27-38; note that when the channel connection is overload and the buffer becomes full,

the processor determines which packets (i.e. volume requests) are discarded. The determining is performed during the overload condition by selecting between the connections using more than their allocated buffer slots and the connections operating within their allocation. The connections using more than their allocated buffer slots lose packets (i.e. volume requests).)

Note that the combined system of Prieto '228 and Montpetit '761 teaches piggyback volume requests are received in the corresponding global queue. Turner'968 teaches determining overload condition and selectively discarding the packets according to the buffer (i.e. queue) allocation. In view of this, having the combined system of Prieto '228 and Montpetit '761, then given the teaching of Turner'968, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Prieto '228 and Montpetit '761, by providing a buffer management mechanism which determines the overload/oversubscribe condition of allocated buffer slots (i.e. a plurality of channels) and discarding selected packets (i.e. volume requests), as taught by Turner'968, since Turner'968 states at col. 3, line 1-6 that such modification would make it possible to efficiently receive, store, and transmit packets, and only when overloaded will excess packets be lost with nonexcess packets protected. The motivation being that by determining and discarding packets according to the priority in the queue/buffer, it will avoid the buffer/queue overload condition.

Regarding Claim 26, the combined system of Prieto '228, Montpetit '761 and Turner'968 discloses BCP determines oversubscription of the plurality of channels as described above in Claim 25.

Furthermore, Turner'968 discloses determining whether each of the plurality of local queues exceeds a respective queuing threshold (see col. 2, line 39-45; the processor identifies/determines the excess packets by comparing with current buffer allocation (i.e. queuing threshold). Thus, it is clear the packet processor determines whether the buffer's fullness utilizing a predetermined allocation.)

In view of this, having the combined system of Prieto '228 and Montpetit '761, then given the teaching of Turner'968, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Prieto '228 and Montpetit '761, by providing a buffer management mechanism which determines the overload/oversubscribe condition of allocated buffer utilizing the buffer fullness/predetermined allocation, as taught by Turner'968, for the same motivation as stated above in claim 25.

17. Claims 30 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Prieto '228 and Montpetit '761, as applied to claim 18 above, and further in view of Charvillat (U.S 5,315,586).

Regarding Claim 30, Prieto '228 discloses BCP is configured to move the requests between local queues and their corresponding global queues as described above in Claim 18.

Prieto '228 does not explicitly disclose moving the rate requests from the local queues to the global queue for reallocation in response to next/another bandwidth request.

However, the above mentioned claimed limitations are taught by Montpetit '761. In particular, Montpetit '761 teaches moving the rate requests from the queues for reallocation

in response to next/another slots for the band width request (see Montpetit '761 col. 15, line 57 to col. 16, line 17; note that when unallocated slots to satisfy next/another high priority bandwidth request, the processor preempts/reallocates the lower priority requests from the queuing slots in order to replace with a higher priority request.)

Note that Prieto '228 teaches receiving and moving bandwidth request between global queues (i.e. wholesaler queues) that stored per band requests, and local queues (i.e. retailer queues) that stored per user/channel request after accepting the reservation. Montpetit '761 teaches that reallocating/moving rate requests according to their priority, and since these request have been accepted and placed in the queues. Prieto '228 teaches two types of queues: wholesaler and retailer queues. In order to reallocate the requests per Montpetit '761 teaching, it is obvious that the requests must move/reallocate from retailer queues (i.e. local queues) to wholesaler queues (i.e. corresponding global queues) so that prioritized request can be processed.

In view of this, having the system of Prieto '228 and then given the teaching of Montpetit '761, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Prieto '228, by providing a mechanism to reallocate/move each request between queues according their priorities/classes, as taught by Montpetit '761, since Montpetit '761 states at col. 2, line 65-67 that such modification would make it possible to enable the data transmission to meet or exceed a user-selected standard of data transmission service, and different data packets in a data transmission may be assigned different levels of priority status so that the overall data transmission meets or exceeds the selected quality of service. The motivation being that by reallocating/moving the requests

between the queues according to their priorities/classes, it can easily process the higher priority requests first.

Neither Prieto '228 nor Montpetit '761 explicitly discloses receiving a defragmentation command and reallocation in response to the defragmentation command.

However, the above mentioned claimed limitations are taught by Charvillat'586. In particular, Charvillat'586 teaches receiving a defragmentation command and reallocation in response to the defragmentation command (see Charvillat'586, see col. 1, line 58-63 and col. 4, line 15-33; note that the user terminal sends reallocation request/command (i.e. defragmentation command) to the switch since the portion of the bandwidth is being used/allocated by other user's connection. Upon receipt of the reallocation request/command, the switch reallocates the bandwidth utilizing the reserved/secondary/pool/shared memory).

Note that the combined system of Prieto '228 and Montpetit '761 teaches reallocation/moving requests between wholesaler queues and retailer queues according to priority of the rate request. Charvillat'586 teaches receiving allocation command/request and performs reallocation accordingly. In view of this, having the combined system of Prieto '228 and Montpetit '761, then given the teaching of Charvillat'586, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Prieto '228 and Montpetit '761, by providing a mechanism to trigger the reallocation of bandwidth request/command, as taught by Charvillat'586, since Charvillat'586 states at col. 1, line 39-44 that such modification would make it possible to provide a flow enforcement arrangement which ensures precision cell-level traffic control by

allowing user terminal to issue a request to increase the amount of bandwidth allocated. The motivation being that by providing the user to sends reallocating/moving requests/command, it can increase the flow control during the transmission.

Regarding Claim 31, the combined system of Prieto '228 and Montpetit '761 discloses an original volume request and BCP as described above in Claim 18. Prieto '228 discloses BCP associating the follow-up request with the original request and placing the bandwidth requests to a particular local queue that stored the original request among the plurality of local queues (see Fig. 4 retailer queues 60 where each user's request is identified by its own respective queue. Thus, the original request and next request (i.e. a follow-up request) must be first related then placed right next to each other in sequential order in the respective retailer queues because each retailer queue uniquely stores each user request).

Prieto '228 does not explicitly disclose the volume requests.

However, the above mentioned claimed limitations are taught by Montpetit '761. In particular, Montpetit '761 teaches the volume requests (see Montpetit '761 col. 9, line 5 to col. 8, line 9-16 and col. 9, line 26-39; note that the plurality of volume-based bandwidth requests are transmitted/received between user terminal and satellite.)

In view of this, having the system of Prieto '228 and then given the teaching of Montpetit '761, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Prieto '228, by providing a plurality of queues which can transmit/receive bandwidth based allocation request, as taught by Montpetit '761, since Montpetit '761 states at col. 2, line 65-67 that such modification would

make it possible to enable the data transmission to meet or exceed a user-selected standard of data transmission service, and different data packets in a data transmission may be assigned different levels of priority status so that the overall data transmission meets or exceeds the selected quality of service. The motivation being that by providing the volume- based allocation requests, it will increase a quality of service for the user.

18. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Prieto '228 and Montpetit '761, as applied to claim 34 above, and further in view of Haulin (U.S 5,502,988).

Regarding claim 32, the combined system of Prieto '228 and Montpetit '761 discloses the BCP and local queues as described above in Claim 31.

Neither Prieto '228 nor Montpetit '761 explicitly disclose a database coupled to the BCP, the database storing a plurality of pointers for the terminal, one of the pointers specifying the particular queue.

However, the above mentioned claimed limitations are taught by Haulin '231. In particular, Haulin '231 teaches a database coupled to the BCP (see Fig. 2, Buffer Memory 32 connecting to the Maintenance Function Unit 52) the database storing a plurality of pointers for the terminal, one of the pointers specifying the particular queue (see Fig. 2, Input and output queues 44.1 to 44.n; col. 11, line 39-50 and col. 6, line 48 to col. 7, line 10; the buffer memory stores pointers in order to identify the positions of the packets in the queues. The pointer for the input queue is for the terminal and the pointer for the output queue is for the bandwidth request location in that particular queue.)

Note that Prieto '228 teaches storing bandwidth requests from the terminal into the local queues. Haulin '231 teaches a buffer memory which stores the pointers to the packets in the input and output queues. In view of this, having the combined system of Prieto '228 and Montpetit '761, then given the teaching of Haulin '231, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Prieto '228 and Montpetit '761, by proving a buffer memory as a database to store/maintain the pointers of various packets (i.e. bandwidth request) so that they can be identified, as taught by Haulin '231, since Haulin '231 states at col. 1, line 66 to col. 3, line 4 that such modification would make it possible to provide error tolerance by a continuous maintenance of pointer handling in a queue system with dynamic indirect addressing. The motivation being that by storing pointers in the memory, it can increase the ability to accurately/correctly identifies the location of the packet in the queue.

19. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Prieto '228 in view of Montpetit '761.

Regarding Claim 33, Prieto '228 discloses one of the global queues stores a plurality of requests (see Prieto '228 col. 6, line 57-60; note that the controller at the satellite queues the bandwidth requests); and BCP spreading the requests across each of the local queues (see Fig. 4, the bandwidth requests are distributed/spread according to each retailer queue).

Prieto '228 does not explicitly disclose the volume requests.

However, the above mentioned claimed limitations are taught by Montpetit '761. In particular, Montpetit '761 teaches the volume requests (see Montpetit '761 col. 9, line 5 to

col. 8, line 9-16 and col. 9, line 26-39; note that the plurality of volume-based bandwidth requests are transmitted/received between user terminal and satellite.)

In view of this, having the system of Prieto '228 and then given the teaching of Montpetit '761, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Prieto '228, by providing a plurality of queues which can transmit/receive bandwidth based allocation request, as taught by Montpetit '761, since Montpetit '761 states at col. 2, line 65-67 that such modification would make it possible to enable the data transmission to meet or exceed a user-selected standard of data transmission service, and different data packets in a data transmission may be assigned different levels of priority status so that the overall data transmission meets or exceeds the selected quality of service. The motivation being that by providing the volume- based allocation requests, it will increase a quality of service for the user.

20. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Prieto '228 and Montpetit '761, as applied to claim 33 above, and further in view of Filipiak (U.S 5,193,090).

Regarding claim 34, the combined system of Prieto '228 and Montpetit '761 discloses the BCP, local queues, and the volume requests in the respective local queue as described above in Claim 18 and 33.

Neither Prieto '228 nor Montpetit '761 explicitly disclose each queue has a counter that counts a quantity of the requests in the respective queue, comparing counter values of the counters with respective predetermined thresholds corresponding to the queues.

However, the above mentioned claimed limitations are taught by Filipiak '090. In particular, Filipiak '090 teaches each queue has a counter (see Fig. 13, plurality of counters

119-123) that counts a quantity of the requests in the respective queue (see Fig. 13, queue 106; see col. 11, line 16-41), comparing counter values of the counters with respective predetermined thresholds corresponding to the queues (see abstract and col. 1, line 16-26, col. 2, line 14-29; note that the counters indicates a queue placing. The memory stores the thresholds values according to the size/bandwidth of each queue, and the threshold values are compared to the counter values in order to determine the number of the packets (i.e. the quantity of the requests) in the queue.)

Note that the combined system of Prieto '228 and Montpetit '761 teaches storing bandwidth volume requests into the corresponding/respective local queue. Filipiak '090 teaches that a queue having a counter, and a counter compares the counter values with threshold values of the queue. In view of this, having the combined system of Prieto '228 and Montpetit '761, then given the teaching of Filipiak '090, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Prieto '228 and Montpetit '761, by providing a counter at each queue memory (i.e. local queue) and a counter compares the counter values (i.e. counts of a quantity of the requests) with threshold values of the queue, as taught by Filipiak '090, since Filipiak '090 states at col. 2, line 60-67 that such modification would make it possible to ensures that the bandwidth allocated to each station contending for access to a common channel or transfer medium/bus architecture is kept in known limits independently of traffic load conditions. The motivation being that by utilizing counters, it can increase the ability to accurately/correctly monitor/maintain the bandwidth requests in the corresponding queues.

21. Claims 35,36,40,41,44-46, and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Prieto (U.S. 6,381,228) in view of Montpetit (U.S. 6,366,761).

Regarding Claim 35, Prieto '228 discloses a method of performing bandwidth allocations, the method comprising:

receiving a bandwidth request from a terminal (see Fig. 2, Step 2, local UET sends reservation request through SRC to Satellite; also see col. 6, line 56-58 and col. 9, line 39-41; note that a Reservation Query Message (RQM) (i.e. bandwidth request), from a user earth terminal (i.e. a terminal), is received at a satellite's uplink input.)

determining bandwidth request type and priority of the received bandwidth request (see Fig. 2, step 4, Satellite Controller process Request; also col. 9, line 5-9 and line 41-44; note that the MAC controller sets/determines the reservation query message based upon the type (i.e. request type) and service class of user (i.e. priority) and the portions of the requested bandwidth);

placing the bandwidth request in one of a plurality of a global queues (see Fig. 4, a plurality of a Wholesaler selection queues 58 at Stage 1; also see col. 9, line 32-34; the controller stores/queues RQM/ATM reservation request into a wholesaler queue.) based upon the determining step, each of the global queues corresponding to each of a plurality of channels (see Fig. 4, Uplink Bands; and see col. 9, line 41-44; note that each wholesaler selection queue is dedicated to each band of a plurality of retail users (i.e. one band contains a plurality of user channels) in the uplink);

moving the bandwidth request from the one global queue to one of a plurality of local queues (see Fig. 4, Stage 2, a plurality of retailer queues 60; and col. 9, line 46-55; note that a

RQM request with the highest priority is selected and moved from a wholesaler queue to retailer queue as a winner), the plurality of local queues corresponding to the plurality of channels (see Fig. 4, Uplink channels 1, 2, 3; and col. 9, line 34-36; note that each retailer queue is dedicated for each retailer user (i.e. one user per channel) in the uplink), wherein the bandwidth request is moved based on loading of the channels (**see col. 9, lines 1-9, 46-59; note that the RQM request's for the channel is moved/transferred according to the loading/fill-level/utilization of the rates/bandwidths/channels. Also, note that PFQ scheduler operates HUFS algorithm which ensures the optimal use of bandwidths/channels based upon loading/fill-level/utilization of bandwidth/channels**); and

allocating transmission slots in response to the bandwidth request stored in the one local queue (see Fig. 2, step 4, Satellite Controller generates Reply message; also see col. 9, line 55-56 and col. 10, line 5-7; note that the highest priority user request is defined and placed it in the retailer queue, and the request is granted by reserving/allocating the quanta/resources/slots. Then, the satellite Controller replies to an user earth terminal with an RGM (Reservation Grant Message) message indicating that the frequency channel for each user quanta/resources/slots have been reserved/allocated.)

Prieto '228 does not explicitly disclose a computer readable medium containing program instructions for execution on a computer system, which when executed by a computer, cause the computer system to perform; and each of the global queues corresponding to a data rate.

However, the above mentioned claimed limitations are taught by Montpetit '761. In particular, Montpetit '761 teaches that a computer readable medium containing program instructions for execution on a computer system (see col. 9, line 40-46; a bandwidth allocation processing unit is implemented in a computer system onboard each satellite), which when executed by a computer, cause the computer system to perform (see col. 13, line 28-49; also see Fig. 10, on-board computer system and where the rules are implemented as computer program instruction stored in the memory); each of the global queues corresponding to a data rate (see Fig. 6, Queue P1 for fixed data rate with high priority, and Queue P2 for lesser data rate priority; see col. 6, line 3-22; note that P1 queue corresponds to higher priority fixed data rate and P2 queue corresponds to lower priority data rate).

Note that Prieto '228 teaches a plurality of wholesaler queues (i.e. global queues). Montpetit '761 teaches the on-board computer system with a set of executable programs stored in the memory; and queues with various rate-based classes. In view of this, having the system of Prieto '228 and then given the teaching of Montpetit '761, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Prieto '228, by providing a computer system with plurality of programs stores in the memory; and a plurality of queues (i.e. global queues) that correspond the data rates such as high priority data rate and lower priority data rate, as taught by Montpetit '761, since Montpetit '761 states at col. 2, line 65-67 that such modification would make it possible to enable the data transmission to meet or exceed a user-selected standard of data transmission service, and different data packets in a data transmission may be assigned different levels of priority status so that the overall data transmission meets or exceeds the selected quality of

service. The motivation being that by providing the plurality of queues and assigning various levels of priority rates to each queue, it will increase a quality of service for the user.

Regarding Claim 36, Prieto '228 discloses the bandwidth request in the receiving step as stated above in Claim 35.

Prieto '228 does not explicitly disclose at least one of a rate request and a volume request, the rate request specifying a constant number of transmission slots, the volume request specifying a specific number of transmission slots.

However, the above mentioned claimed limitations are taught by Montpetit '761. In particular, Montpetit '761 teaches at least one of a rate request and a volume request (see Montpetit '761 col. 9, line 5 to col. 8, line 9-16; note that the rate allocation request and bandwidth request are transmitted/received between user terminal and satellite), the rate request specifying a constant number of transmission slots (see Montpetit '761 col. 7, line 64 to col. 8, line 5; note that rate based allocation request is determined according to a specified number of slots per frame for transmission of a corresponding number of data packets. Thus, in order to define a rate, a constant number of transmission slots must be determined/specified), the volume request specifying a specific number of transmission slots (see Montpetit '761 col. 8, line 32-40; note that when bandwidth allocation request is sent, the slots in a frame are allocated only once for transmission of a specified number of data packet. Thus, in order to define a volume base allocation/request, a specific/per-determined number of transmission slots must be determined/specified).

In view of this, having the system of Prieto '228 and then given the teaching of Montpetit '761, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Prieto '228, by providing a plurality of queues (i.e. global queues) which can transmit/receive both rate based allocation request and bandwidth based allocation request, as taught by Montpetit '761, since Montpetit '761 states at col. 2, line 65-67 that such modification would make it possible to enable the data transmission to meet or exceed a user-selected standard of data transmission service, and different data packets in a data transmission may be assigned different levels of priority status so that the overall data transmission meets or exceeds the selected quality of service. The motivation being that by providing the allocation request and bandwidth based allocation request, it will increase a quality of service for the user.

Regarding Claim 40, Prieto '228 discloses the global queues in the placing step as described above in Claim 35.

Prieto '228 does not explicitly disclose placing according to the bandwidth request type and the associated priority.

However, the above mentioned claimed limitations are taught by Montpetit '761. In particular, Montpetit '761 teaches disclose placing according to the bandwidth request type (see col. 7, line 64 to col. 8, line 59; note that the bandwidth request type is either Rate-based allocation request or volume-based bandwidth allocation request) and the associated priority (see Montpetit '761 col. 5, line 61 to col. 6, line 2; note that each allocation request is placed into the queues according to the quality of service classes (i.e. priority).)

In view of this, having the system of Prieto '228 and then given the teaching of Montpetit '761, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Prieto '228, by providing a method to place the rate based allocation request and bandwidth based allocation request into the respective queues, as taught by Montpetit '761, since Montpetit '761 states at col. 2, line 65-67 that such modification would make it possible to enable the data transmission to meet or exceed a user-selected standard of data transmission service, and different data packets in a data transmission may be assigned different levels of priority status so that the overall data transmission meets or exceeds the selected quality of service. The motivation being that by placing various service class allocation requests into the queues before hand, it will decrease the request processing since the allocation requests have already classified/prioritized.

Regarding Claim 41, Prieto '228 discloses the bandwidth request type and priority of the received bandwidth request as described above in Claim 35.

Prieto '228 does not explicitly disclose high priority rate request, a low priority rate request, a high priority volume request, and a low priority volume request.

However, the above mentioned claimed limitations are taught by Montpetit '761. In particular, Montpetit '761 teaches high priority rate request (see Fig. 6, P1 130; col. 6, line 3-14; col. 8, line 6-21; note that a high priority rate allocation request is assigned as P1 class and placed into P1 queue), a low priority rate request (see Fig. 6, P3 132; col. 6, line 23-33; col. 8, line 32-57; note that a low priority rate-based bandwidth allocation request is assigned as P3 class and placed into P3 queue), a high priority volume request (see Fig. 6, P2 131; col.

6, line 15-22; col. 8, line 6-21; note that a high priority volume allocation request is assigned as P2 class and placed into P2 queue), and a low priority volume request (see Fig. 6, P4 132; col. 6, line 33-41; col. 8, line 32-57; note that a low priority volume-based bandwidth allocation request is assigned as P4 class and placed into P3 queue.)

Note that Prieto '228 teaches a plurality of wholesaler queues (i.e. global queue), bandwidth requests and priority of received bandwidth request. Montpetit '761 teaches classifying/prioritizing the bandwidth rate-based allocation requests and volume-based allocation request and placing them into the respective queues. In view of this, having the system of Prieto '228 and then given the teaching of Montpetit '761, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Prieto '228, by further classifying/prioritizing the bandwidth request type and priority of requests into more specific the bandwidth rate-based allocation requests and volume-based allocation request and placing them into respective queues, as taught by Montpetit '761, since Montpetit '761 states at col. 2, line 65-67 that such modification would make it possible to enable the data transmission to meet or exceed a user-selected standard of data transmission service, and different data packets in a data transmission may be assigned different levels of priority status so that the overall data transmission meets or exceeds the selected quality of service. The motivation being that by classifying/prioritizing allocation requests, it will increase the speed of the request processing since the allocation requests are already classified/prioritized.

Regarding Claim 44, Prieto '228 discloses the plurality of channels are designated as data channels that are sequentially ordered (see Fig. 4, plurality of data channels in Uplink Bands and they sequentially order from 1 to U links/channels).

Prieto '228 does not explicitly disclose the allocating step comprising: selectively assigning the transmission slots according to a prescribed order of the data channels based upon the bandwidth request type.

However, the above mentioned claimed limitations are taught by Montpetit '761. In particular, Montpetit '761 teaches the allocating step comprising: selectively assigning the transmission slots according to a prescribed order of the data channels based upon the bandwidth request type (see Montpetit '761 col. 7, line 49 to col. 8, line 40; note that uplink channels/slots are assigned/allocated according to two different formats of bandwidth allocation requests in the predetermined/prescribed order in the different priority/class queues/buffers: rate-based allocation request and volume-based allocation request.)

Note that Prieto '228 teaches a plurality of channels (or) unlink data slots in sequential order. Montpetit '761 teaches allocating/assigning each request in the uplink data slots/channels according to different priorities/classes. In view of this, having the system of Prieto '228 and then given the teaching of Montpetit '761, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Prieto '228, by providing a mechanism to allocate/assign each request in the uplink data slots/channels according to different priorities/classes and predetermined/prescribed order, as taught by Montpetit '761, since Montpetit '761 states at col. 2, line 65-67 that such modification would make it possible to enable the data transmission to meet or exceed a user-

selected standard of data transmission service, and different data packets in a data transmission may be assigned different levels of priority status so that the overall data transmission meets or exceeds the selected quality of service. The motivation being that by allocating/assigning each request in the uplink data slots/channels according to the different priorities/classes and predetermined/prescribed order, it will increase the speed of the request processing since the allocation requests have already classified/prioritized.

Regarding Claim 45, the combined system of Prieto '228 and Montpetit '761 discloses the prescribed order in selectively assigning step and the plurality of channels as descried above in Claim 44.

Furthermore, Montpetit '761 discloses assigning the first data channel if the bandwidth request type is rate request (see Fig. 6, P1 where P1 is the first high priority rate request queue/buffer; col. 6, line 3-14; and see Fig. 7, Bandwidth allocation table, where GT1 P1 is the first bandwidth allocation request being stored/assigned in the table; col. 14, line 4-19; note that high priority rate request is being stored/assigned as in the first channel/slot in the bandwidth allocation table (row frequency f1 and time t1)).

In view of this, having the system of Prieto '228 and then given the teaching of Montpetit '761, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Prieto '228, by providing a mechanism to allocate/assign each rate request in the first uplink data slot/channel according to the different priorities/classes, as taught by Montpetit '761, for the same motivation as stated above in Claim 44.

Regarding Claim 46, the combined system of Prieto '228 and Montpetit '761 discloses the prescribed order in selectively assigning step and the plurality of channels as descried above in Claim 44.

Furthermore, Montpetit '761 discloses assigning the last data channel if the bandwidth request type is volume request (see Fig. 6, P4 where P4 is the last low priority volume request queue/buffer; col. 6, line 33-41; and Fig. 7, Bandwidth allocation table, where GT3 P4 is the last volume-based bandwidth allocation request being stored/assigned in the table; col. 14, line 4-19; note that low priority volume request is being stored/assigned as in the last channel/slot in the bandwidth allocation table (row frequency f4 and time t2)).

In view of this, having the system of Prieto '228 and then given the teaching of Montpetit '761, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Prieto '228, by providing a mechanism to allocate/assign each volume request in the last uplink data slots/channels according to the different priorities/classes, as taught by Montpetit '761, for the same motivation as stated above in Claim 44.

Regarding Claim 50, Prieto '228 discloses receiving a plurality of requests (see Prieto '228 col. 6, line 57-60; note that DAMA controller at the satellite queues the bandwidth requests); and spreading the requests across each of the local queues (see Fig. 4, the bandwidth requests are distributed/spread according to each retailer queue).

Prieto '228 does not explicitly disclose receiving volume requests.

However, the above mentioned claimed limitations are taught by Montpetit '761. In particular, Montpetit '761 teaches receiving volume requests (see Montpetit '761 col. 9, line 5 to col. 8, line 9-16 and col. 9, line 26-39; note that the plurality of volume-based bandwidth requests are transmitted/received between user terminal and satellite.)

In view of this, having the system of Prieto '228 and then given the teaching of Montpetit '761, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Prieto '228, by providing a plurality of queues which can transmit/receive volume-based allocation request, as taught by Montpetit '761, since Montpetit '761 states at col. 2, line 65-67 that such modification would make it possible to enable the data transmission to meet or exceed a user-selected standard of data transmission service, and different data packets in a data transmission may be assigned different levels of priority status so that the overall data transmission meets or exceeds the selected quality of service. The motivation being that by providing the volume- based allocation requests, it will increase a quality of service for the user.

22. Claims 37 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Prieto '228 and Montpetit '761, as applied to claim 35 above, and further in view of Leung (U.S 6,574,231).

Regarding claim 37, Prieto '228 discloses local queues as stated above in Claim 35. Montpetit '761 discloses the bandwidth request in the receiving step is a rate request (see Montpetit '761 col. 9, line 5 to col. 8, line 9-16; note that rate allocation request and bandwidth request are transmitted/received between user terminal and satellite).

Neither Prieto '228 nor Montpetit '761 does not explicitly discloses filling the one local queue with subsequent rate requests up to a queuing threshold; and filling another one of the local queues with additional rate requests upon filling the one local queue beyond the queuing threshold.

However, the above mentioned claimed limitations are taught by Leung '231. In particular, Leung '231 teaches filling the one queue with subsequent rate requests up to a queuing threshold; and filling another one of the local queues with additional rate requests upon filling the one queue beyond the queuing threshold (see Leung '231 col. 2, line 9-26; note that the received a data frame (i.e. Subsequent rate request) is written to first storage memory (i.e. filling the one queue). Then after, a second data frame (i.e. addition rate request) is received, and the size of the data frame exceeds the space in the storage location (i.e. a queuing threshold) in the memory. Then a second data frame is written into a second storage memory since the first storage memory can no longer accept any new data frame.) Thus, it is clear that a data frame that receives at the port can be the subsequent rate request and additional rate request. The memory storage locations are queues/buffers since they have a capability to store/hold/fill the data.)

In view of this, having the combined system of Prieto '228 and Montpetit '761, then given the teaching of Leung '231, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Prieto '228 and Montpetit '761, by proving a method to store/fill the frame/packet (i.e. original rate allocation request) into a first memory storage (i.e. local queue) until it exceed the excepted space/threshold, then store/fill the additional frame/packet (i.e. additional request) into the

second memory/local queue (i.e. another local queue), as taught by Leung '231, since Leung '231 states at col. 2, line 40-45 that such modification would make it possible to eliminate the needs for a separate memory. The motivation being that by utilizing local memory queues/storages, it will save cost for not requiring separate memory.

Regarding claim 38, neither Prieto '228 nor Montpetit '761 explicitly discloses the queuing threshold in the step of filling the one local queue is predetermined.

However, the above mentioned claimed limitations are taught by Leung '231. In particular, Leung '231 teaches the queuing threshold in the step of filling the one local queue is predetermined (see Leung '231 col. 4, line 55 to col. 5, line 11; note that the memory storage (i.e. local queue) size is set up to 1 M bytes.)

In view of this, having the combined system of Prieto '228 and Montpetit '761, then given the teaching of Leung '231, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Prieto '228 and Montpetit '761, by proving a fixed memory size for the storage queue, as taught by Leung '231, for the same motivation as stated above in Claim 37.

23. Claim 39 is rejected under 35 U.S.C. 103(a) as being unpatentable over Prieto '228, Montpetit '761 and Leung '231, as applied to claims 35-37 above, and further in view of Fan (U.S 6,424,622).

Regarding claim 39, the combined system of Prieto '228, Montpetit '761, and Leung '231 discloses the queuing threshold in the step of filling the one local queue according to the rate requests in the plurality of local queues as described above in Claim 35 and 37.

Neither Prieto '228, Montpetit '761, nor Leung '231 explicitly discloses the queuing threshold is dynamically established according to a total number of rate requests in the plurality of queues.

However, the above mentioned claimed limitations are taught by Fan '622. In particular, Fan '622 teaches the queuing threshold is dynamically established according to a total number of rate requests in the plurality of queues (see Fan '622 col. 2, line 49-44 and col. 6, line 6-62; note that the common threshold is dynamically set for the queues, and it is adapted to change to a new threshold value based upon the maximum length of the queue and the old value in the queues (i.e. total number of rate requests in the plurality of queues). Thus, in order to define the old threshold, the number of rate request in the plurality of queues must be determined first, then based upon the maximum length of the queue, the new threshold is dynamically calculated).

In view of this, having the system of Prieto '228, Montpetit '761 and Leung '231 then given the teaching of Fan '622, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Prieto '228, Montpetit '761 and Leung '231, by providing a way to calculate the dynamic buffer threshold based upon the maximum buffer size and the number of frames/data/requests in the current threshold, as taught by Fan '622, since Fan '622 states at col. 2, line 40-44 that such modification would make it possible to provide an ATM switch that uses a dynamic queue

threshold scheme that enables efficient utilization of available memory regardless of the numbers of overloaded queues. The motivation being that by utilizing dynamic buffer threshold, it will increase throughput and efficiency in the memory/buffer.

24. Claims 42 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Prieto '228 and Montpetit '761, as applied to claim 35 above, and further in view of Turner (U.S 4,849,968).

Regarding Claim 42, Prieto '228 discloses the bandwidth request in the receiving step, and it is received over at least one a data channel, the method further comprising: receiving a piggybacked volume request over the data channel (see col. 7, line 18-25; note that UET (user equipment terminal) utilizes a current data stream to piggyback more bandwidth resource request instead of sending a new RQM request message); placing the piggybacked request in a corresponding one of the global queues (see Fig. 4, a plurality of a Wholesaler selection queues 58 at Stage 1; also see col. 9 , line 32-34; the controller stores/queues the reservation request into a wholesaler queue.)

Prieto '228 does not explicitly disclose receiving a volume request over a contention channel.

However, the above mentioned claimed limitations are taught by Montpetit '761. In particular, Montpetit '761 teaches receiving a volume request over a contention channel (see col. 10, line 1-17; note that the ground terminal sends the volume-based request to the satellite by utilizing either an exiting allocated data channel (i.e. current data stream/channel) or contention channel.)

Note that Prieto '228 teaches receiving a bandwidth request over a current data stream into one of the wholesaler queues (i.e. global queue) by utilizing piggybacking mechanism. Montpetit '761 teaches receiving volume request and a method of utilizing contention channel to send request to the satellite from the ground station. In view of this, having the system of Prieto '228 and then given the teaching of Montpetit '761, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Prieto '228, by providing a mechanism to receive the volume request utilizing the contention channel, as taught by Montpetit '761, since Montpetit '761 states at col. 2, line 65-67 that such modification would make it possible to enable the data transmission to meet or exceed a user-selected standard of data transmission service, and different data packets in a data transmission may be assigned different levels of priority status so that the overall data transmission meets or exceeds the selected quality of service. The motivation being that by utilizing a contention channel to send allocation requests, it will increase the probability of the satellite receiving the request since there is more than one option to send the request.

Neither Prieto '228 nor Montpetit '761 explicitly discloses determining whether the plurality of channels are oversubscribed; and selectively discarding the request based upon the step of determining whether the plurality of channels are oversubscribed.

However, the above mentioned claimed limitations are taught by Turner'968. In particular, Turner'968 teaches determining whether the plurality of channels are oversubscribed (see col. 2, line 22-27; note that the packet processor determines the overload/oversubscribed condition by first determining allocated number of buffer slots (i.e. a plurality of channels)); and selectively discarding the volume request based upon the step

of determining whether the plurality of channels are oversubscribed (see col. 2, line 27-38; note that when the channel connection is overload and the buffer becomes full, the processor determines which packets (i.e. volume requests) are discarded. The determining is performed during the overload condition by selecting between the connections using more than their allocated buffer slots and the connections operating within their allocation. The connections using more than their allocated buffer slots lose packets (i.e. volume requests).)

Note that the combined system of Prieto '228 and Montpetit '761 teaches piggyback volume requests are received in the corresponding global queue. Turner'968 teaches determining overload condition and selectively discarding the packets according to the buffer (i.e. queue) allocation. In view of this, having the combined system of Prieto '228 and Montpetit '761, then given the teaching of Turner'968, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Prieto '228 and Montpetit '761, by providing a buffer management mechanism which determines the overload/oversubscribe condition of allocated buffer slots (i.e. a plurality of channels) and discarding selected packets (i.e. volume requests), as taught by Turner'968, since Turner'968 states at col. 3, line 1-6 that such modification would make it possible to efficiently receive, store, and transmit packets, and only when overloaded will excess packets be lost with nonexcess packets protected. The motivation being that by determining and discarding packets according to the priority in the queue/buffer, it will avoid the buffer/queue overload condition.

Regarding Claim 43, the combined system of Prieto '228, Montpetit '761 and Turner'968 discloses the step of determining whether the plurality of channels are oversubscribed as described above in Claim 42.

Furthermore, Turner'968 discloses determining whether each of the plurality of local queues exceeds a respective queuing threshold (see col. 2, line 39-45; the processor identifies/determines the excess packets by comparing with current buffer allocation (i.e. queuing threshold). Thus, it is clear the packet processor determines whether the buffer's fullness utilizing a predetermined allocation.)

In view of this, having the combined system of Prieto '228 and Montpetit '761, then given the teaching of Turner'968, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Prieto '228 and Montpetit '761, by providing a buffer management mechanism which determines the overload/oversubscribe condition of allocated buffer utilizing the buffer fullness/predetermined allocation, as taught by Turner'968, for the same motivation as stated above in claim 42.

25. Claims 47 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Prieto '228 and Montpetit '761, as applied to claim 35 above, and further in view of Charvillat (U.S 5,315,586).

Regarding Claim 47, Prieto '228 discloses receiving a plurality of bandwidth requests (see Prieto '228 col. 6, line 57-60; note that DAMA controller at the satellite queues

the bandwidth requests), moving the request between local and their corresponding global queues as described above in Claim 35.

Prieto '228 does not explicitly disclose moving the rate requests from the local queues to the global queue for reallocation in response to next/another bandwidth request.

However, the above mentioned claimed limitations are taught by Montpetit '761. In particular, Montpetit '761 teaches moving the rate requests from the queues for reallocation in response to next/another slots for the band width request (see Montpetit '761 col. 15, line 57 to col. 16, line 17; note that when unallocated slots to satisfy next/another high priority bandwidth request, the processor preempts/reallocates the lower priority requests from the queuing slots in order to replace with a higher priority request.)

Note that Prieto '228 teaches receiving and moving bandwidth request between global queues (i.e. wholesaler queues) that stored per band requests, and local queues (i.e. retailer queues) that stored per user/channel request after accepting the reservation. Montpetit '761 teaches that reallocating/moving rate requests according to their priority, and since these request have been accepted and placed in the queues. Prieto '228 teaches two types of queues: wholesaler and retailer queues. In order to reallocate the requests per Montpetit '761 teaching, it is obvious that the requests must move/reallocate from retailer queues (i.e. local queues) to wholesaler queues (i.e. corresponding global queues) so that prioritized request can be processed.

In view of this, having the system of Prieto '228 and then given the teaching of Montpetit '761, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Prieto '228, by providing a mechanism to

reallocate/move each request between queues according their priorities/classes, as taught by Montpetit '761, since Montpetit '761 states at col. 2, line 65-67 that such modification would make it possible to enable the data transmission to meet or exceed a user-selected standard of data transmission service, and different data packets in a data transmission may be assigned different levels of priority status so that the overall data transmission meets or exceeds the selected quality of service. The motivation being that by reallocating/moving the requests between the queues according to their priorities/classes, it can easily process the higher priority requests first.

Neither Prieto '228 nor Montpetit '761 explicitly discloses receiving a defragmentation command and reallocation in response to the defragmentation command.

However, the above mentioned claimed limitations are taught by Charvillat'586. In particular, Charvillat'586 teaches receiving a defragmentation command and reallocation in response to the defragmentation command (see Charvillat'586, see col. 1, line 58-63 and col. 4, line 15-33; note that the user terminal sends reallocation request/command (i.e. defragmentation command) to the switch since the portion of the bandwidth is being used/allocated by other user's connection. Upon receipt of the reallocation request/command, the switch reallocates the bandwidth utilizing the reserved/secondary/pool/shared memory).

Note that the combined system of Prieto '228 and Montpetit '761 teaches reallocation/moving requests between wholesaler queues and retailer queues according to priority of the rate request. Charvillat'586 teaches receiving allocation command/request and performs reallocation accordingly. In view of this, having the combined system of Prieto '228

and Montpetit '761, then given the teaching of Charvillat'586, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Prieto '228 and Montpetit '761, by providing a mechanism to trigger the reallocation of bandwidth request/command, as taught by Charvillat'586, since Charvillat'586 states at col. 1, line 39-44 that such modification would make it possible to provide a flow enforcement arrangement which ensures precision cell-level traffic control by allowing user terminal to issue a request to increase the amount of bandwidth allocated. The motivation being that by providing the user to sends reallocating/moving requests/command, it can increase the flow control during the transmission.

Regarding Claim 48, the combined system of Prieto '228 and Montpetit '761 discloses receiving the plurality of bandwidth requests as described above in Claim 35. Prieto '228 discloses associating the follow-up request with the original request and placing the bandwidth requests to a particular local queue that stored the original request among the plurality of local queues (see Fig. 4 retailer queues 60 where each user's request is identified by its own respective queue. Thus, the original request and next request (i.e. a follow-up request) must be first related then placed right next to each other in sequential order in the respective retailer queues because each retailer queue uniquely stores each user request).

Prieto '228 does not explicitly disclose receiving volume requests.

However, the above mentioned claimed limitations are taught by Montpetit '761. In particular, Montpetit '761 teaches receiving volume requests (see Montpetit '761 col. 9, line 5

to col. 8, line 9-16 and col. 9, line 26-39; note that the plurality of volume-based bandwidth requests are transmitted/received between user terminal and satellite.)

In view of this, having the system of Prieto '228 and then given the teaching of Montpetit '761, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Prieto '228, by providing a plurality of queues which can transmit/receive bandwidth based allocation request, as taught by Montpetit '761, since Montpetit '761 states at col. 2, line 65-67 that such modification would make it possible to enable the data transmission to meet or exceed a user-selected standard of data transmission service, and different data packets in a data transmission may be assigned different levels of priority status so that the overall data transmission meets or exceeds the selected quality of service. The motivation being that by providing the volume- based allocation requests, it will increase a quality of service for the user.

26. Claim 49 is rejected under 35 U.S.C. 103(a) as being unpatentable over Prieto '228 and Montpetit '761, as applied to claim 48 above, and further in view of Haulin (U.S 5,502,988).

Regarding claim 49, the combined system of Prieto '228 and Montpetit '761 discloses the associating step and local queues as described above in Claim 48.

Neither Prieto '228 nor Montpetit '761 explicitly disclose maintaining a database of pointers for the terminal, one of the pointers specifying the particular queue.

However, the above mentioned claimed limitations are taught by Haulin '231. In particular, Haulin '231 teaches maintaining a database (see Fig. 2, Buffer Memory 32) of pointers for the terminal, one of the pointers specifying the particular queue (see Fig. 2, Input

and output queues 44.1 to 44.n; col. 11, line 39-50 and col. 6, line 48 to col. 7, line 10; the buffer memory stores pointers in order to identify the positions of the packets in the queues. The pointer for the input queue is for the terminal and the pointer for the output queue is for the bandwidth request location in that particular queue.)

Note that Prieto '228 teaches storing bandwidth requests from the terminal into the local queues. Haulin '231 teaches a buffer memory which stores the pointers to the packets in the input and output queues. In view of this, having the combined system of Prieto '228 and Montpetit '761, then given the teaching of Haulin '231, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Prieto '228 and Montpetit '761, by proving a buffer memory as a database to store/maintain the pointers of various packets (i.e. bandwidth request) so that they can be identified, as taught by Haulin '231, since Haulin '231 states at col. 1, line 66 to col. 3, line 4 that such modification would make it possible to provide error tolerance by a continuous maintenance of pointer handling in a queue system with dynamic indirect addressing. The motivation being that by storing pointers in the memory, it can increase the ability to accurately/correctly identifies the location of the packet in the queue.

27. Claim 50 is rejected under 35 U.S.C. 103(a) as being unpatentable over Prieto '228 in view of Montpetit '761.

Regarding Claim 50, Prieto '228 discloses receiving a plurality of requests (see Prieto '228 col. 6, line 57-60; note that DAMA controller at the satellite queues the

bandwidth requests); and spreading the requests across each of the local queues (see Fig. 4, the bandwidth requests are distributed/spread according to each retailer queue).

Prieto '228 does not explicitly disclose receiving volume requests.

However, the above mentioned claimed limitations are taught by Montpetit '761. In particular, Montpetit '761 teaches receiving volume requests (see Montpetit '761 col. 9, line 5 to col. 8, line 9-16 and col. 9, line 26-39; note that the plurality of volume-based bandwidth requests are transmitted/received between user terminal and satellite.)

In view of this, having the system of Prieto '228 and then given the teaching of Montpetit '761, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Prieto '228, by providing a plurality of queues which can transmit/receive bandwidth based allocation request, as taught by Montpetit '761, since Montpetit '761 states at col. 2, line 65-67 that such modification would make it possible to enable the data transmission to meet or exceed a user-selected standard of data transmission service, and different data packets in a data transmission may be assigned different levels of priority status so that the overall data transmission meets or exceeds the selected quality of service. The motivation being that by providing the volume- based allocation requests, it will increase a quality of service for the user.

28. Claim 51 is rejected under 35 U.S.C. 103(a) as being unpatentable over Prieto '228 and Montpetit '761, as applied to claim 50 above, and further in view of Filipiak (U.S 5,193,090).

Regarding claim 51, the combined system of Prieto '228 and Montpetit '761 discloses the local queues and the volume requests in the respective local queue as described above in Claim 35 and 50.

Neither Prieto '228 nor Montpetit '761 explicitly disclose each queue has a counter that counts a quantity of the requests in the respective queue, the distributing step comprising: comparing counter values of the counters with respective predetermined thresholds corresponding to the queues.

However, the above mentioned claimed limitations are taught by Filipiak '090. In particular, Filipiak '090 teaches each queue has a counter (see Fig. 13, plurality of counters 119-123) that counts a quantity of the requests in the respective queue (see Fig. 13, queue 106; see col. 11, line 16-41), the distributing step comprising: comparing counter values of the counters with respective predetermined thresholds corresponding to the queues (see abstract and col. 1, line 16-26, col. 2, line 14-29; note that the counters indicates a queue placing. The memory stores the thresholds values according to the size/bandwidth of each queue, and the threshold values are compared to the counter values in order to determine the number of the packets (i.e. the quantity of the requests) in the queue.)

Note that the combined system of Prieto '228 and Montpetit '761 teaches storing bandwidth volume requests into the corresponding/respective local queue. Filipiak '090 teaches that a queue having a counter, and a counter compares the counter values with threshold values of the queue. In view of this, having the combined system of Prieto '228 and Montpetit '761, then given the teaching of Filipiak '090, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Prieto '228 and Montpetit '761, by providing a counter at each queue memory (i.e. local queue) and a counter compares the counter values (i.e. counts of a quantity of the requests) with threshold values of the queue, as taught by Filipiak '090, since

Filipiak '090 states at col. 2, line 60-67 that such modification would make it possible to ensures that the bandwidth allocated to each station contending for access to a common channel or transfer medium/bus architecture is kept in known limits independently of traffic load conditions. The motivation being that by utilizing counters, it can increase the ability to accurately/correctly monitor/maintain the bandwidth requests in the corresponding queues.

Response to Arguments

28. Applicant's arguments with respect to claims 1-51 have been considered but are moot in view of the same ground(s) of rejection.

Regarding claims 1-51, the applicant argued that, "...the reference (i.e. Montpeti'761) teaches away from their combination...(in page 18, line 6)...Montpeti'761 system employs a queuing mechanism at **a terrestrial location**...(in page 19, 2nd last sentence)...Prieto'228 utilizes **onboard mechanism...**(in page 20, line 1). Thus, the proposed combination of Prieto'228 and Montpeti'761 is unsustainable...(in page 20, line 2)" in page

In response to applicant's argument, it is noted that the features upon which applicant relies (i.e., **a terrestrial location and onboard mechanism**) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

In response to applicant's argument, the examiner respectfully disagrees that the reference teaches away from their combination. The test for obviousness is not whether the

features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). In particular, Prieto'228's global queues are modified (**not replaced**) according to the **teaching** of Montpeti'761 so that each queue corresponds to a data rate. Thus, it is clear that by modifying the Prieto'228's global queue with the teaching of Montpeti'761 queue utilization **would not destroy** the combination. Thus, Montpeti'761 does not teach away the combination.

The applicant argued that, "...there is no technical basis to modify the first stage queues to provide the priority status levels taught by Montpeti'761...(in page 20, last paragraph, line 1-2".

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, as recited by 1st office action, the motivation is suggested by Montpeti'761 in col. 2, line 60-67 , that such modification would make it possible to **enable** the data transmission to **meet or exceed a user-selected standard of data transmission service**, and different data packets in a data transmission may be assigned

different levels of priority status so that the **<u>overall</u>** data transmission **<u>meets</u>** or **<u>exceeds</u>** the **selected quality of service.** In addition, Montpeti'761 disclose in col. 3, lines 8-12 that by utilizing plurality of queue with assigned priority status, the bandwidth for transmitting higher priority data packet can be allocated before bandwidth for low priority packet.

Therefore, when considering the combination of Prieto'228 and Montpeti'761 as whole at the time of the invention made, one skilled in the art would have been motivated to modify the system of Prieto '228, by providing a plurality of queues that correspond the data rates such as high priority data rate and lower priority data rate, as taught by Montpetit '761, since Montpetit '761 states at col. 2, line 60-67 and col. 3, lines 8-12, that such modification would make it possible to enable the data transmission to **meet or exceed a user-selected standard of data transmission service**, and different data packets in a data transmission may be assigned different levels of priority status so that the **<u>overall</u>** data transmission **meets** or **exceeds** the **selected quality of service**.

In view of the above, **the examiner respectfully disagrees** with applicant's argument and believes that the combination of references as set forth in the 103 rejections is proper, thus, Claims 1-51 are obvious over Prieto'228in view of Montpeti'761 for at least the reasons discussed above. Moreover, applicant's amendment on claims 1,18 and 35 necessitated the same ground(s) of rejection in this office action since the new limitation "based on loading of the channels" still reads on the combined Prieto'228 and Montpeti'761 references identifying as "according to the loading/fill-level/utilization of the rates/bandwidths/channels".

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ian N Moore whose telephone number is 703-605-1531. The examiner can normally be reached on M-F: 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Ngo can be reached on 703-305-4798. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

INM
4/13/04

RICKY NGO
PRIMARY EXAMINER